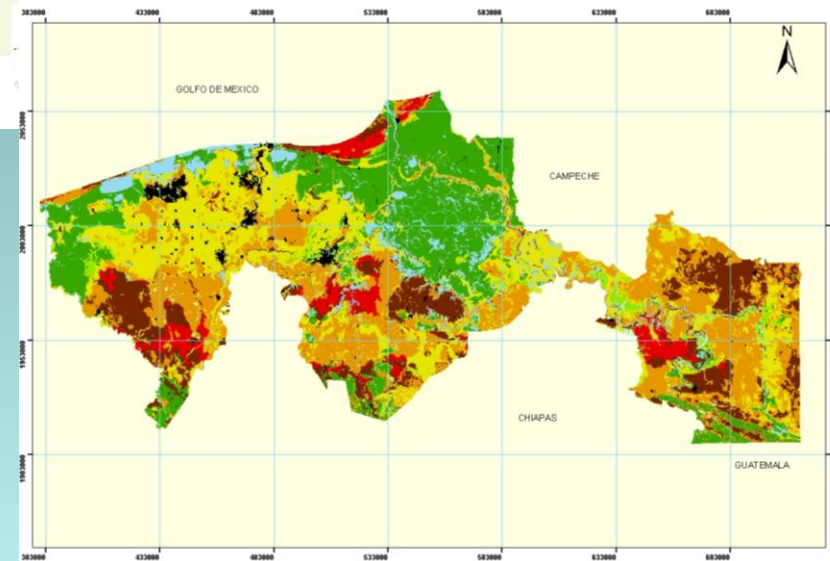


Climate change impacts on the wetlands of Tabasco, Mexico

**L. Gama, R. Collado-Torres, C. Pacheco-Figueroa,
J. Valdez-Leal, H. Diaz-Lopez, C. Villanueva-Garcia,
M. Arturo Ortiz-Perez & E. Moguel-Ordoñez**

Tabasco

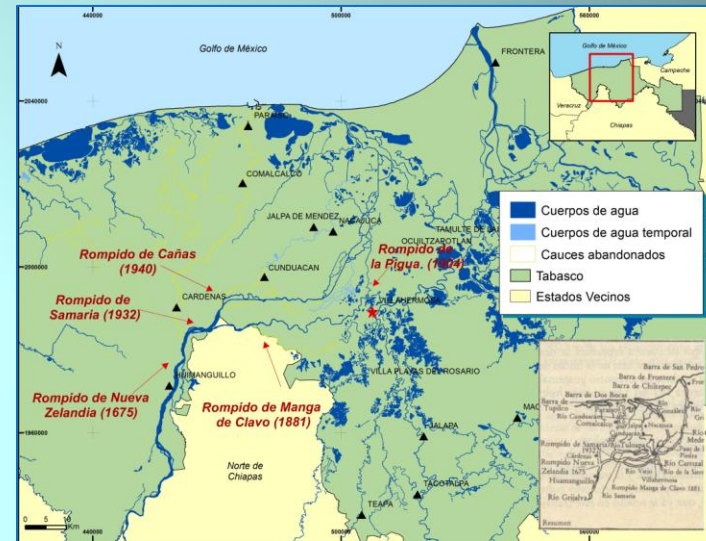
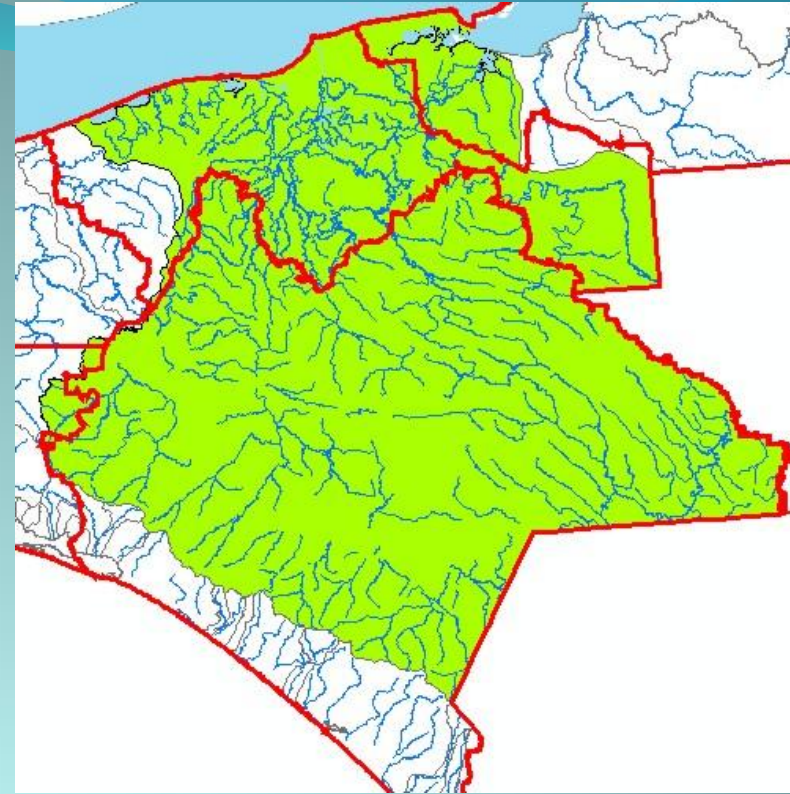


2 526 700 hectares
60% grasslands
~5000 pipelines
~4300 drilling rigs



The Grijalva-Usumacinta basin ,the biggest in Mexico, the most dynamic 91,345 km² (4.7%)

- Plains
- 83 rivers
- Natural flooding areas
- Gley soils with almost no drainage
- Land Change
- No urban planning
- High rainfall



Wetlands

Biosphere Reserves with
intertidal forested
wetlands; forests and
mangrove swamps,
nipah swamps
and tidal freshwater

Everglades
National Park

610,497 hectares

Centla swamps
Biosphere reserve
302,706 hectares



20/06/2012

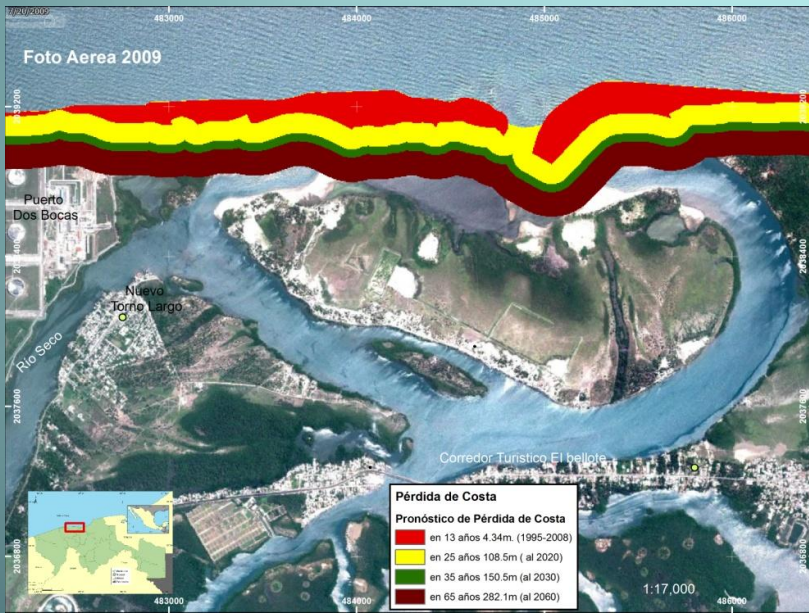
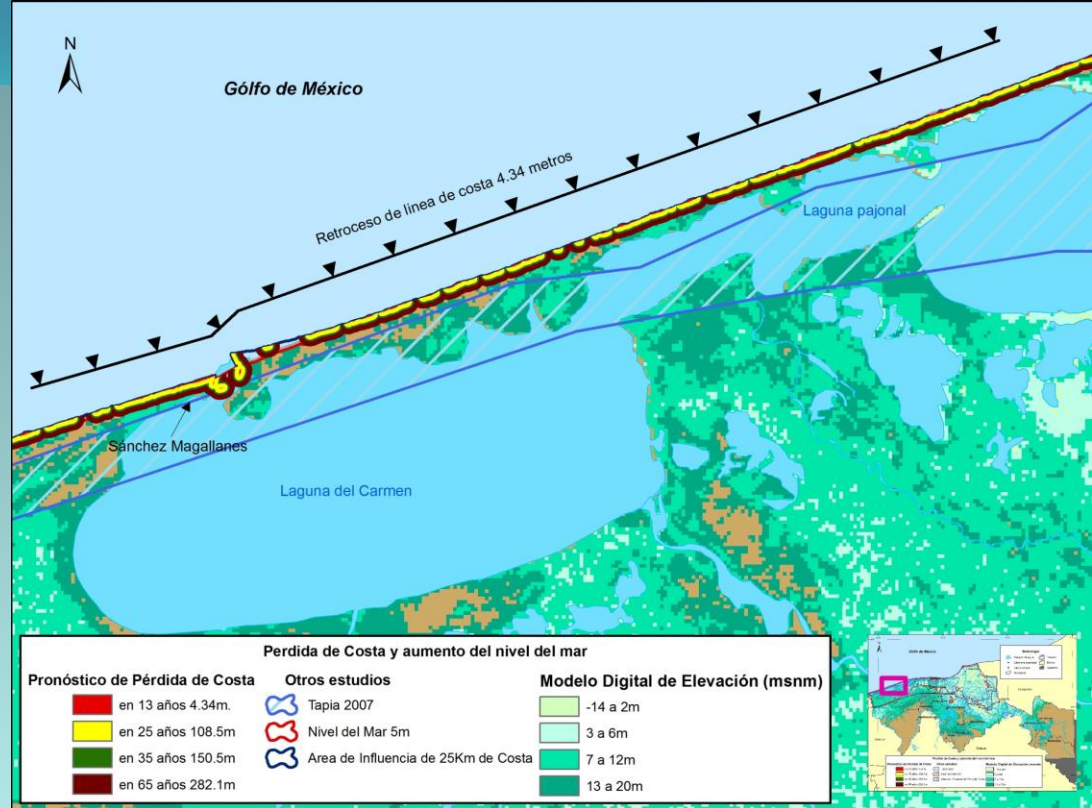
Copyright 2005 Wetlands International

Ramsar Convention
Department of Geoscience, University of Arizona

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Rates of potential change (losses and gains) from 1995 to 2008



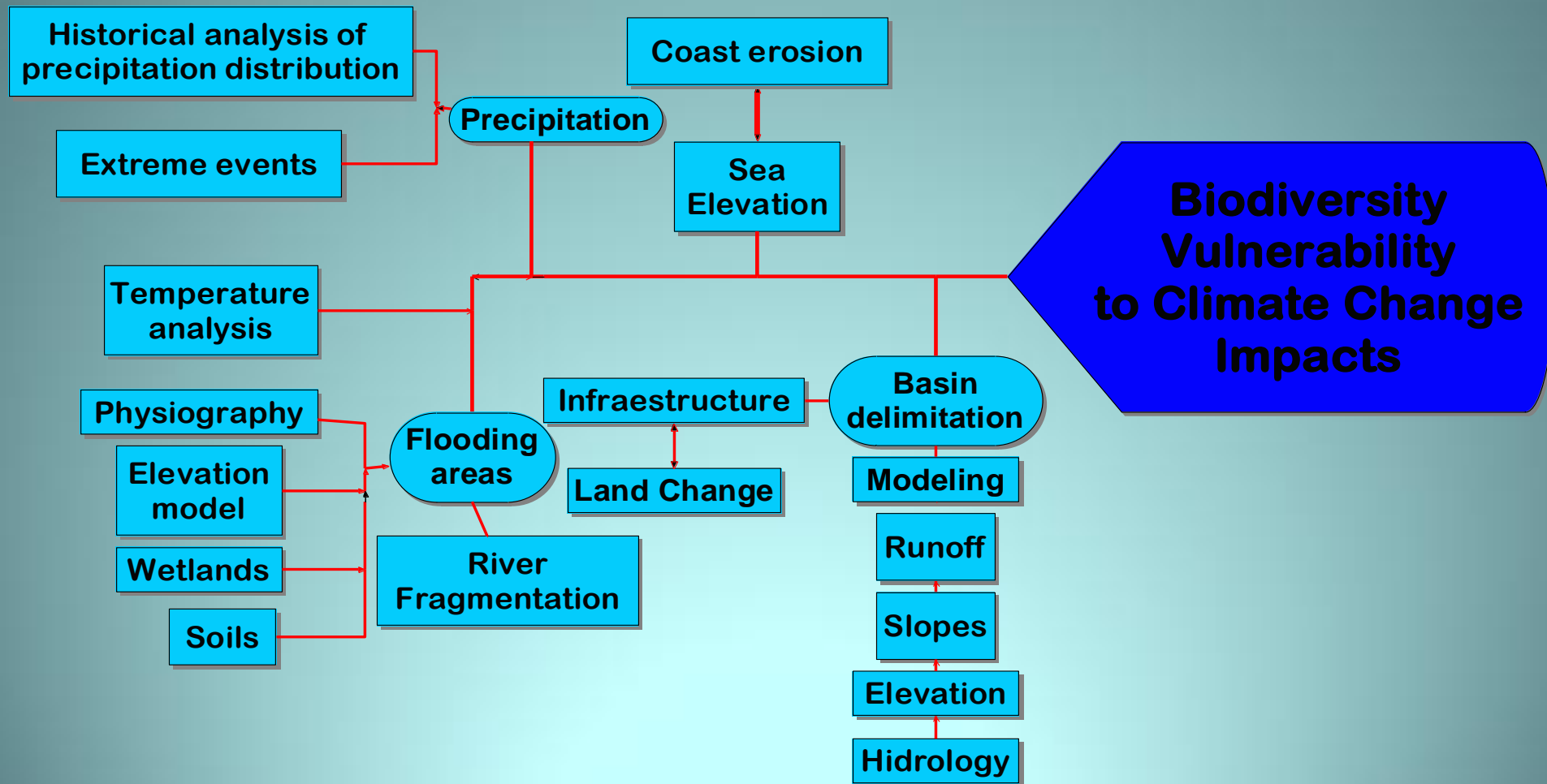


The objective of this research was to study global warming effects on this region, and to generate potential future sceneries.

What threats would be present due to **Global Warming on Tabasco wetlands?**

**Increase on temperature,
Increase on extreme extraordinary
hydrometeorological events
with floods
Sea level increase
soil salinization**

Methodology



Temperature effects on Tabasco

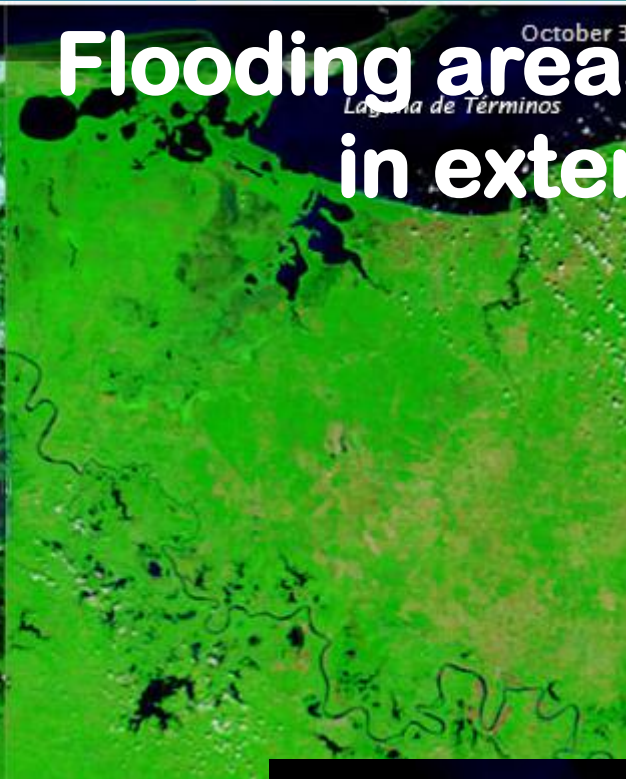
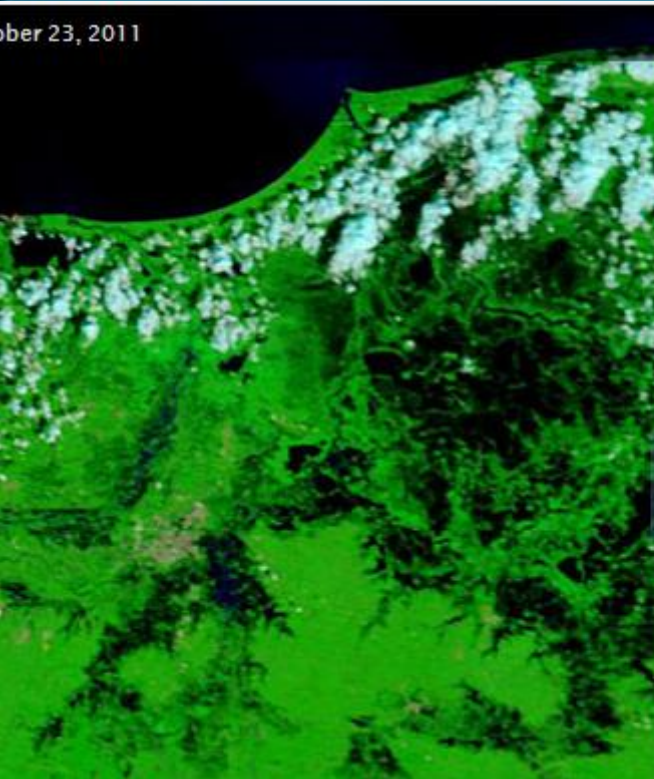
- During the last 12 years the world has experience **on average the 10 must warmest** of the last two decades.
- **On Tabasco** studies preliminares muestran un posible incremento de dos a tres grados centígrados.
- Actualmente **Tabasco** tiene un promedio de **máximas mensuales es de 34.6** así como un promedio de **temperaturas mínimas de 21.7**, lo que pronostica un cambio de una **temperatura mínima promedio de 24.6** y **una máxima de 37.6**; que en la temporada de estiaje cuando el termómetro alcanza los **42** grados centígrados, para ubicarse en los **45 a 46** grados.

ber 23, 2011

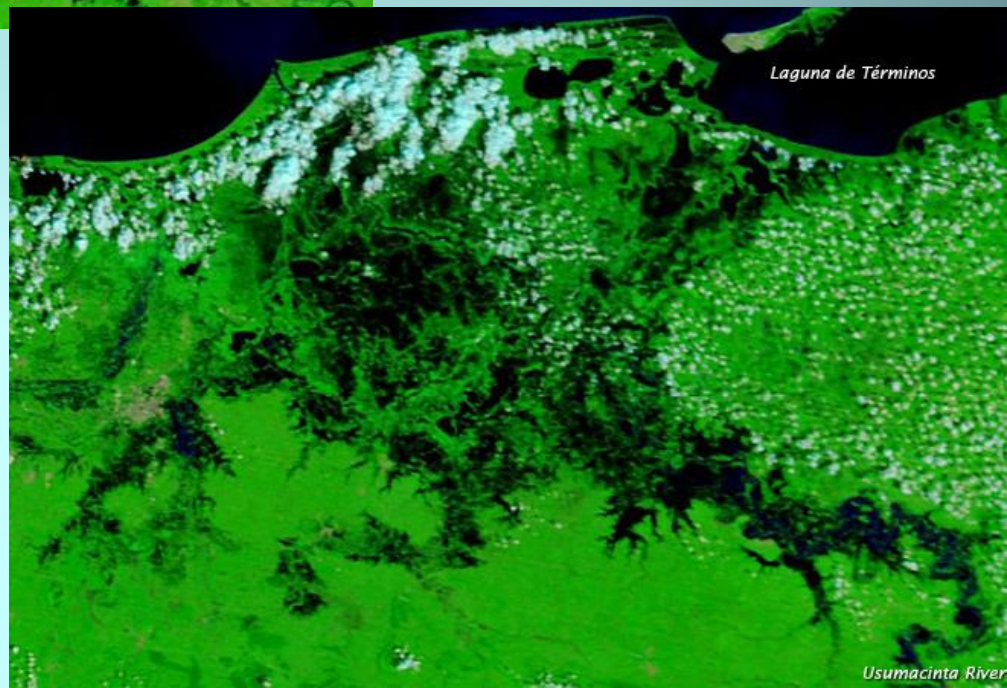
Flooding areas had increase in extension, duration and magnitude

October 3

Laguna de Términos

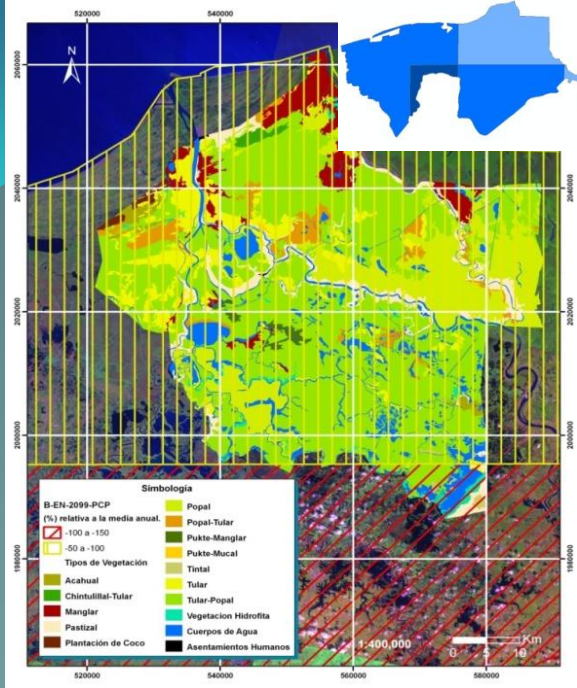


2011

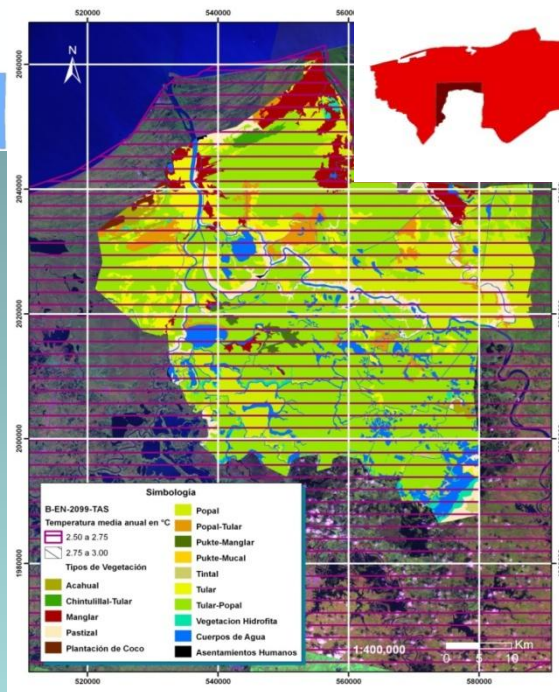


Laguna de Términos

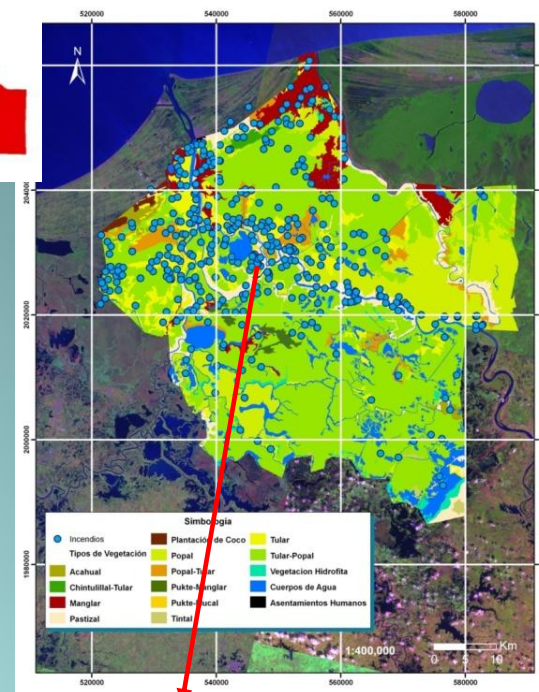
Usumacinta River



**100 mm
< in rain**



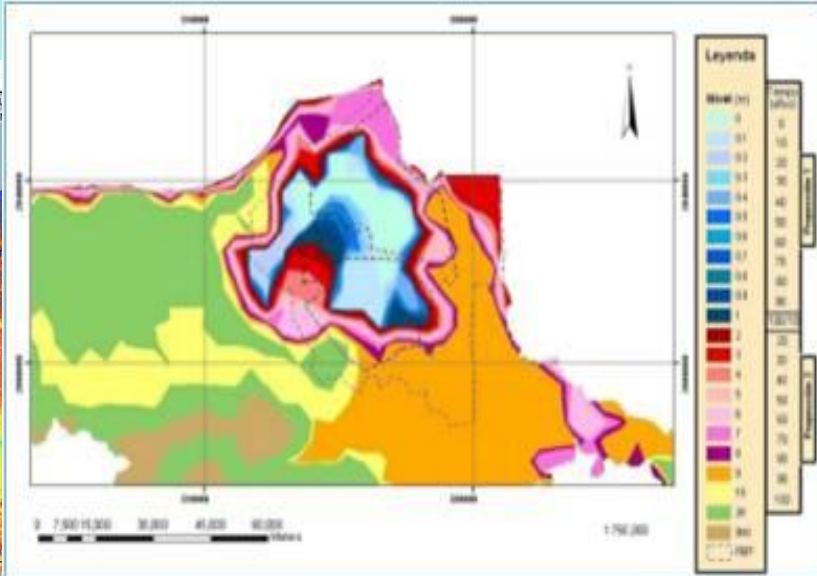
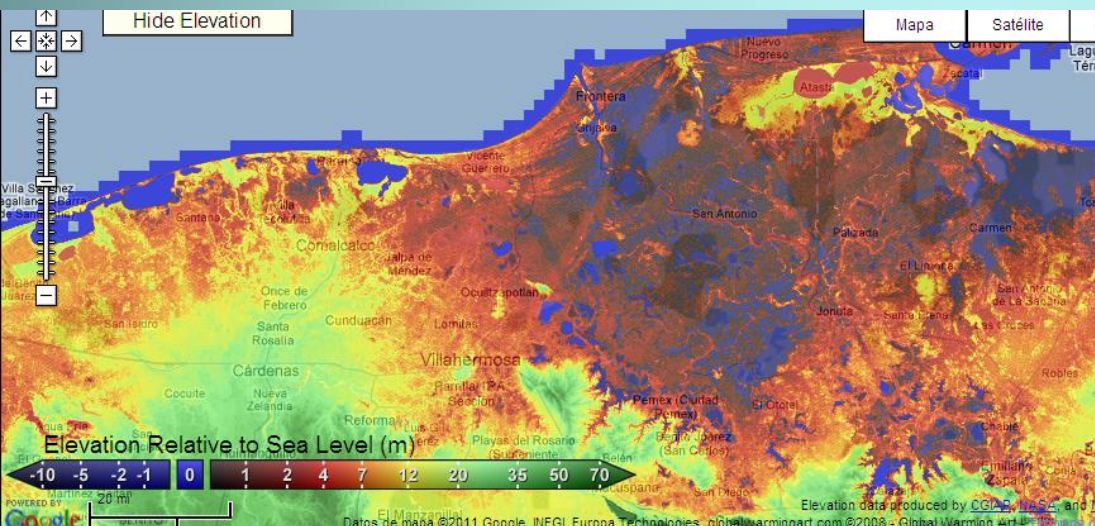
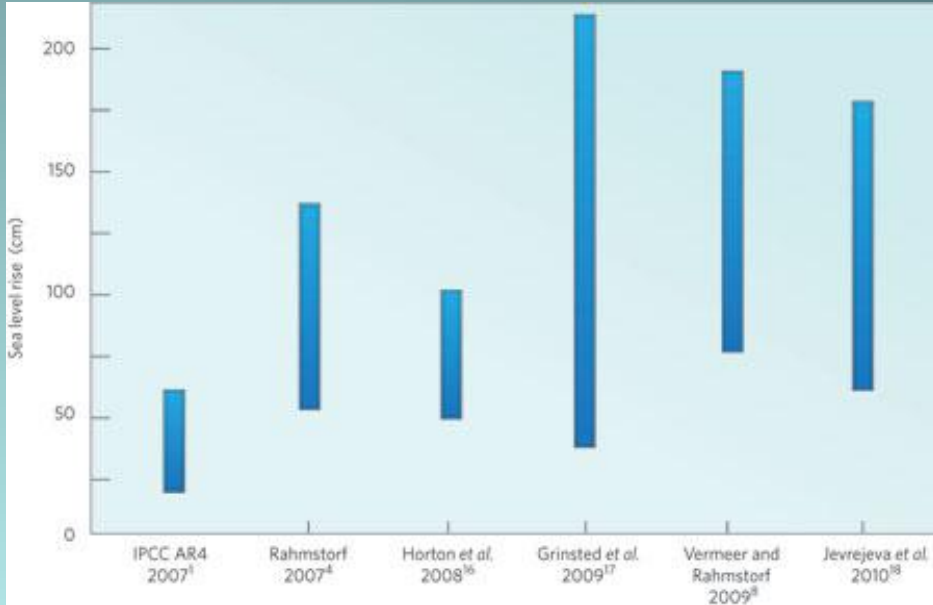
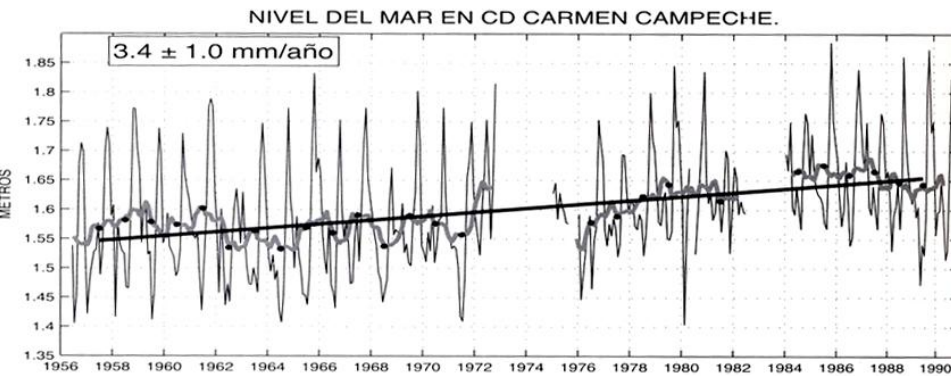
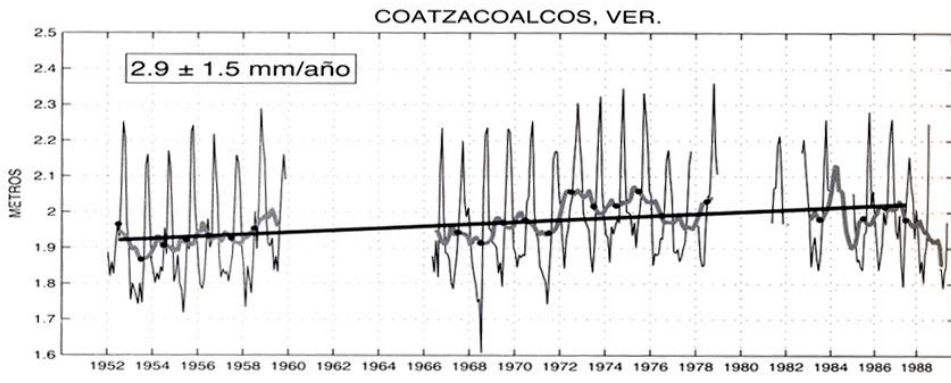
**3°C > in
temperature**



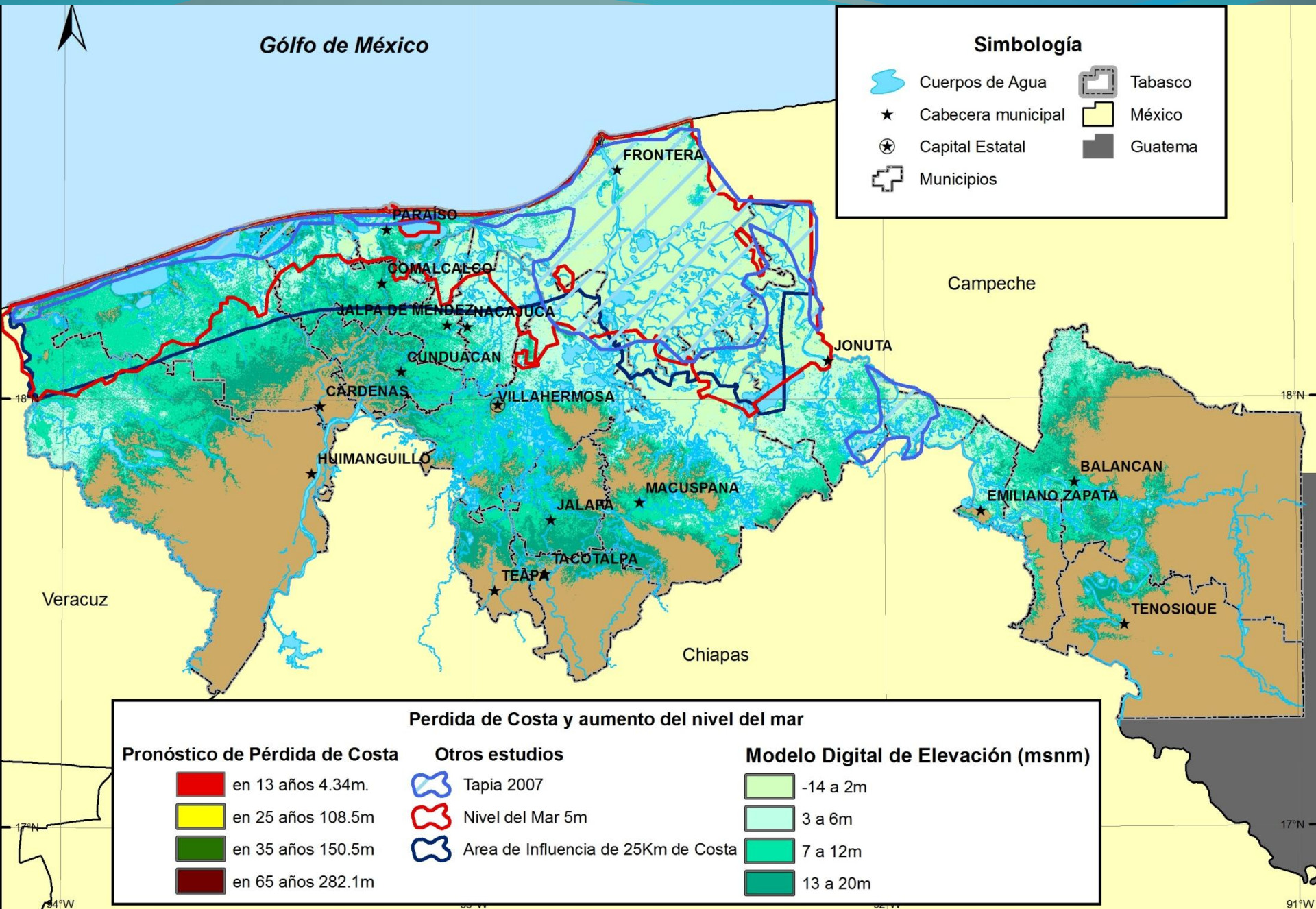
**Fires
1999 to 2003**

**Models estimate:
An increase in temperature with more possibilities for
fires
A decrease in rainfall and changes in the distribution
resulting in more and worst extraordinary events.**

Sea level



Elevation data produced by CGRS, NASA, and...
 Datos de mapa ©2011 Google, INEGI, Europa Technologies, globalwarmingart.com ©2008 - Global Warming Art



Golfo de México

Simbología

- Cuerpos de Agua
- Cabecera municipal
- Capital Estatal
- Municipios
- Tabasco
- México
- Guatemala

Veracruz

Campeche

Chiapas

Perdida de Costa y aumento del nivel del mar

Pronóstico de Pérdida de Costa

- en 13 años 4.34m.
- en 25 años 108.5m
- en 35 años 150.5m
- en 65 años 282.1m

Otros estudios

- Tapia 2007
- Nivel del Mar 5m
- Area de Influencia de 25Km de Costa

Modelo Digital de Elevación (msnm)

- 14 a 2m
- 3 a 6m
- 7 a 12m
- 13 a 20m

18°N

18°N

17°N

17°N

94°W

96°W

92°W

91°W

FRONTERA

PARAÍSO

OOMALCALCO

JALPA DE MENDEZNACAJUCA

CUNDUACAN

CARDENAS

HUIMANGUILLO

VILLAHERMOSA

JALAPA

MACUSPANA

TEAP

TACOTALPA

JONUTA

BALANCAN

EMILIANO ZAPATA

TENOSIQUE



Vulnerability of Centla biosphere reserve

Endanger species on the
biosphere reserve
According to
NOM-059-SEMARNAT-2001

CATEGORY	Flora	Fauna
P	1	9
A	2	1
Pr	0	4
TOTAL	3	14

P= En peligro de extinción, A= Amenazada, Pr= Sujeta a protección especial.

CONCLUSIONS

Historic shifts in the course of rivers (natural, infrastructure protection, hydroelectric dam, irrigation) had affected the extension, duration and magnitude of floods, altering wetland processes

Sea level, is the greatest threat for coastal wetlands.

Connectivity between fragments and the formation of corridors is the adaptation proposed.

Vulnerability can be reduced with appropriate public policy to prevent, mitigate or adapt to environmental change, biological corridors are an alternative